

## ABSTRACT OF THE DISCLOSURE

A U-valve apparatus including a bidirectional check valve for controlling the flow of liquid from a vessel while preventing inadvertent discharge from the vessel. The check valve allows passage of a fluid such a gas into the vessel, for purposes of agitating the liquid or for other purposes, and also permits the evacuation of the liquid from the vessel. The U-valve apparatus is advantageously included in a universal fluid exchange device including upper and lower reaction vessel supports which include pressure sealed injection and evacuation ports for each supported reaction vessel. Reaction vessels matingly engage through the injection and evacuation ports with fittings which are connected through flexible tubing to respective supplying and receiving vessels. Each of one or more reaction vessels may suitably be connected by a U-valve apparatus including a check valve to a corresponding receiving vessel. The reaction vessels or fittings are moved into position, as required, so that reactants may be directly supplied from supplying vessels in the order and amount desired without operation of valves that can become contaminated, and so that the reaction vessels may dispel their contents into the appropriate receiving vessels. The system may be highly advantageous in applications such as combinatorial chemistry where myriad combinations of chemicals, solvents and reagents are employed.